

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

BATHYCONCHOECIA, A NEW GENUS OF PELAGIC
OSTRACODS (MYODOCOPA HALOCYPRIDIDAE)
WITH SIX NEW SPECIES FROM THE DEEPER
WATERS OF THE GULF OF MEXICO

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Specimens of ostracods taken from the stomach and intestines of bottom fish, collected at depths of 1000 and 3165 m in the Gulf of Mexico, were sent by Dr. Thomas Bright, then of Texas A&M University, to Dr. Louis Kornicker at the U. S. National Museum. Since nine of these specimens belonged to the family Halocyprididae, Dr. Kornicker submitted them to me for identification. The nine specimens, all mature individuals with the possible exception of one female, proved to represent six new species of a new genus. Eight of the specimens were found in the intestines of three species of bottom fish, *Nezumia hildebrandi*, *Bassozetus normalis*, and *Dicromita agassizii*. The shells of most of the specimens were soft and flexible and although all the soft tissues had been dissolved away, the exoskeleton, including that of the appendages, was more or less intact. One specimen was found in the stomach of *Nezumia hildebrandi*; this specimen still retained a good deal of its musculature. With one exception, the smaller ostracods, 0.93-1.66 mm long, were found in the intestine of *Dicromita agassizii*, collected at a depth of 1000 m. The two largest specimens, 3.1 and 5.2 mm long, were taken from the intestine of *Bassozetus normalis*, obtained in a dredge sample from 3165 m depth. The smallest specimen, 0.85 mm long, was found in the intestine of *Nezumia hildebrandi*, and

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a 1.9 mm specimen was taken from the stomach of this fish; the last two specimens were females, the others males. A specimen of *Bathyvargula* sp., a benthic form, was also found in the stomach of *Nezumia*, and another Cypridinid ostracod was taken from the intestines of *Dicromita* (Kornicker, in press).

I am very grateful to Dr. Kornicker and Dr. Bright for permission to study and describe these specimens, which were collected by Texas A&M University under Contract NONR 2119(04) of the Office of Naval Research. I am deeply indebted to Dr. Raymond Manning, Chairman of the Department of Invertebrate Zoology, for granting me office space and the privileges of the laboratory in the Division of Crustacea, and to all the members of the staff of the Division of Crustacea for innumerable kindnesses to me during my months at the U. S. National Museum. I also thank Dr. Kornicker and Dr. T. E. Bowman for criticizing the manuscript and Dr. Fenner Chace for advice on etymology. This work was supported by grant GB-6879 from the National Science Foundation.

THE CLASSIFICATION OF THE HALOCYPRIDIDAE

Poulsen (1962) agreed with Skogsberg (1920) in dividing Sars' Myodocopa into two suborders, the Cypridiniformes and the Halocypriformes, the latter of which includes the truly pelagic marine forms. The suborder Halocypriformes contains but one family, the Halocyprididae, and this includes two subfamilies, the Thaumatoocyprinae and the Conchoeciinae. Hitherto, the subfamily Conchoeciinae has included four genera: *Conchoecia* Dana, *Halocypris* Dana, *Archiconchoecia* Müller, and *Euconchoecia* Müller. Since the new species here described are apparently living at considerable depths, probably not far above the bottom, and at least within the depth ranges of the bottom fish that ate them, the name *Bathyconchoecia* is given to the new genus to which they belong. Two previously described species assigned to the genus *Euconchoecia*, *E. lacunosa* Müller and *E. darcythompsoni* Scott, also belong in this new genus.

Müller's (1912) key to the genera of Conchoeciinae is amended as follows to include the new genus:

KEY TO THE GENERA OF THE CONCHOECIINAE

1. The two terminal, often fused, segments of the first antenna with 5 setae or sensory filaments 2

1. These segments with more than 5 setae or filaments 3
2. Basal segment of endopodite of second antenna with a tubercle (processus mammillaris) on its anterior margin *Conchoecia*
2. This segment without a processus mammillaris *Halocypris*
3. Terminal segments of first antenna with 6 similar sensory filaments *Archiconchoecia*
3. These segments with 20 or more setae and sensory filaments 4
4. Terminal segments of first antenna with 20-40 setae and filaments; furca with 7 claws *Euconchoecia*
4. These segments with more than 100 setae and filaments; furca with 8 claws *Bathyconchoecia*

Bathyconchoecia new genus

Shell distinctively sculptured, especially in smaller species, pattern of tiny pits characteristic; dorsal concavity approximately at center of hinge line, rostrum and rostral incisure well developed. Shell glands symmetrical, at or near postero-dorsal corners. Frontal organ lacking or reduced to a peg. First antenna of 4-5 segments (segmentation may not be clear), 4th segment ventrally with large oval cluster of over 200 sensory filaments and distally with an unusually large plumose seta; male 5th segment with principal seta and 3 filaments, female's with principal seta and 2 filaments. Basal segment of endopodite of second antenna with 2 bristles distally, 1 exceptionally long; last endopodite segment with 2 setae and 3 filaments, and in male also a hook-like clasping organ on right endopodite, clasping organ of left endopodite smaller or lacking. Mandible characteristically lacks protruding distal articular process of coxa; 3 plumose setae at distal end of basis. Sixth limbs not markedly sexually dimorphic. Furca with 8 long weak claws and an exceptionally long unpaired bristle behind the claws; 1st claw jointed or with indications of jointing.

Type-species: *Bathyconchoecia paulula* new species.

Etymology: From Greek "bathys" = deep, plus *Conchoecia*, meaning deep-living *Conchoecia*. Feminine gender.

Shell: The members of this genus are characterized by the sculpturing of the shell, which is especially distinctive in the 3 smaller species. All have a pattern of tiny pits over the shell, although traces of this were hard to find on 2 of the specimens. Aside from this, the smaller species are strikingly sculptured with reticulations and cross-striations, such as were described by Müller (1908) for *B. lacunosa*. Scott (1909) said that the shell was ornamented with faint delicate reticulations in both sexes of *B. darcythompsoni*. Although the shape of the shell varies, all the species have well developed rostrums, the rostrum usually protruding well beyond the anterior margin of the shell, and a deep rostral incisure. Also, all the species have a dorsal concavity at approximately the middle of the hinge line. This was made especially evident by the transparency of the shells, but may not be so noticeable in intact freshly

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caught individuals. The asymmetrical glands are situated symmetrically, as in *Euconchoecia*, at or near the postero-dorsal corners.

Frontal organ: No well developed frontal organ has been found, but in some of the specimens a small peg, situated near the base of the first antenna, may represent the remnant of the frontal organ. Concerning the frontal organ of *B. lacunosa*, Müller wrote: "Frontalorgan des ♀ auf einen kurzen Zapfen reduziert (?)." Scott made no mention of a frontal organ in *B. darcythompsoni*. All other Conchoeciinae have frontal organs, although these are most highly developed in the genus *Conchoecia*. In *Euconchoecia* and *Archiconchoecia* the frontal organ is an undifferentiated rod which extends just beyond the tip of the first antenna, whereas in *Halocypris* it is 2-segmented. The single species, *Thaumatocypris echinata*, of the subfamily Thaumatocyprinae lacks a frontal organ.

First antenna: This consists of 5 segments in the males and probably also in the females. The 4th segment bears distally a large plumose seta and ventrally the large cluster of sensory filaments. The species here described had at least 250 such filaments arranged like the facets of a compound eye, in 10 or more rows of 25 or more filaments per row. Viewed dorsally or ventrally this cluster is oval in outline, and from each "facet" a sensory filament is produced. These filaments project out stiffly for a short distance, then become very weak and flabby and so transparent that it is virtually impossible to determine their length, unless they are clumped together. In the male the 5th segment produces the principal seta and 3 filaments; in the single obviously mature female it was possible to distinguish only the principal seta and 2 filaments on the last segment. In the genus *Euconchoecia* males and females have a cluster of 20-24 filaments on the 4th segment, but these are each borne individually and apparently arranged in 3 rows of 7 or so each.

Second antenna: As in *Halocypris*, *Euconchoecia*, and *Archiconchoecia*, there is no processus mammillaris on the basal segment of the endopodite, which bears on its dorsal distal margin 2 spines or setae, one of which is usually quite long. In the female the 2nd endopodite segment bears 2 setae and 3 filaments. Mature females of *Euconchoecia* have only 2 setae and 1 filament on the 2nd endopodite segment. In males of *Bathyconchoecia* the 2nd segment of the endopodite of the right second antenna has 2 setae and a hook-like clasping organ, and from the proximal portion of the clasping organ 3 filaments are produced. The 2nd segment usually has 2 short fat spines beneath the curve of the clasping organ. The left endopodite may lack the hook of a clasping organ, but from its basal section 3 filaments are similarly produced.

Mandible: This is very similar in the 4 smaller species, but in the largest species, *B. foveolata* n. sp., the last segment of the endopodite is exceptionally small and the incisor edges of the basis and coxa are different from those of the other 5 species. In *B. sagittarius* n. sp. the incisor edge of the coxa is different in structure from that of the other

species, but the basis and endopodite segments are similar to those of the smaller species. In general, the incisor surface of the basis and the endopodite of the mandible are fairly similar in structure to those of the other genera of Conchoeciinae. These species of *Bathyconchoecia*, however, have 3 plumose setae on the dorsal distal part of the basis in the location where, according to Iles (1961, Fig. 5), in *Conchoecia* a single seta on a papilla represents the remnant of the exopodite. *Halocypris globosa*, *Euconchoecia chierchiaie*, and *Archiconchoecia striata* also have a single seta in this location. The distal articular process of the coxa, which occurs in other genera of Conchoeciinae, is lacking in all but one (*B. sagittarius* n. sp.) of these species of *Bathyconchoecia*.

Maxilla: on the 2nd endopodite segment there are 4 setae between the 2 thicker claw-setae. *Euconchoecia chierchiaie* and *E. aculeata* also have 4 setae, but in *Conchoecia*, *Halocypris*, and *Archiconchoecia striata* there are 3 setae in this location.

Fifth limb: This is fairly similar throughout the Conchoeciinae. These species of *Bathyconchoecia*, except *B. foveolata* n. sp., have an exceptionally long seta arising from a papilla at the dorsal distal end of the 1st exopodite segment.

Sixth limb: This is clearly sexually dimorphic in *Conchoecia* and *Euconchoecia*, whereas in *Halocypris globosa* and *Archiconchoecia striata* the sixth limbs of males and females are fairly similar. For *Bathyconchoecia* the data are insufficient, but there is no marked sexual dimorphism. In males of *Conchoecia* and *Euconchoecia* the 3 setae on the last exopodite segment are exceptionally long, as long or longer than the limb itself, and plumose. These setae were lost from the sixth limb of 2 of the *Bathyconchoecia* males, but in the *B. paulula* n. sp. and *B. foveolata* n. sp. males, and also in male *B. darcythompsoni* (Scott), 1 seta is exceptionally long and the other 2 considerably shorter. In the *B. kornickeri* n. sp. male all 3 setae are long, 1 somewhat shorter than the other 2. Males and females may have an exceptionally long seta arising from a papilla at the dorsal distal end of the 1st exopodite segment.

Seventh limb: This is not distinctive in the Conchoeciinae. Except in one instance (the *B. kornickeri* n. sp. male, which had both setae of the same length) 1 of the 2 long setae of the last segment is longer than the other.

Furca: This is distinctive and differs from that of other Conchoeciinae in that the 8 pairs of claws are exceptionally long, slim and weak. In other genera the last pairs of claws are quite small, but in *Bathyconchoecia* these claws may be more like setae and not much shorter than the first several pairs. In the larger species, the 1st claw is 5 or 6-jointed. Scott's (1909, Pl. IV, Fig. 11) figure of the furca of *B. darcythompsoni* shows the 1st claw 5-jointed. Indications of jointing of the 1st claw are found in the smaller species. Of the other genera of Conchoeciinae, indications of jointing are seen only in *Euconchoecia*. Behind the claws

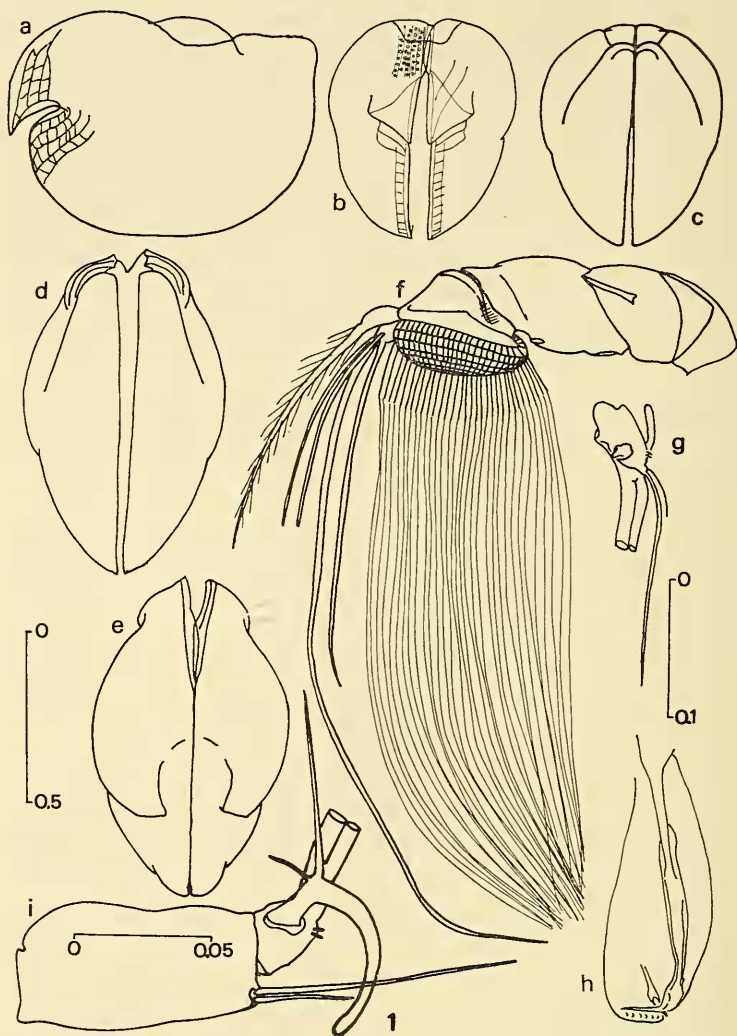


FIG. 1. Male *Bathyconchoecia paulula* n. sp. a-e, Lateral, anterior, posterior, ventral and dorsal views of shell. f, First antenna. g, Second segment of endopodite of left second antenna (setae cut off). h, Penis. i, Endopodite of right second antenna (setae cut off). Scale on i for g and i; at left margin for a-e; at right margin for f and h. Scales in mm.

there is a single exceptionally long unpaired bristle. Such a bristle may occur in the other genera, but it is usually very short. In *Euconchoecia* there are only 7 claws on the furca, but there is a rounded bump between the 1st and 2nd claws similar to the process with which a claw articulates.

All members of the suborder Halocypriformes lack eyes.

The genus *Bathyconchoecia* at present includes 8 species, ranging in length of mature specimens from 0.93–5.2 mm. Of these the 3 smaller species here described, *B. paulula* n. sp., *B. laqueata* n. sp., and *B. kornickeri* n. sp., 0.93–1.66 mm long, form a natural group, being fairly similar in shape and in the sculpturing of the shell and character of the appendages. In all probability *B. lacunosa* (Müller) belongs in this group. Müller (1908) described this species from a 1.6 mm female, possibly a juvenile, collected at the Gaussstation at 66°29'S, 89°38'E. Both *B. galerita* n. sp. and *B. sagittarius* n. sp., here described from a 1.9 mm female and a 3.1 mm male, respectively, differ from all the others in some respects. The two largest species, *B. foveolata* n. sp., here described from a 5.2 mm male, and *B. darcythompsoni* (Scott), 4.7 mm long, may possibly be grouped together. Scott (1909) described the latter species from 2 males, a female, and 2 immature males collected from a depth of 1140 m at 59°36'N, 7'W. The distribution of the genus therefore extends from almost 60°N in the Atlantic to the Gulf of Mexico and to 69°S in the Antarctic.

Of the group of smaller species, the most complete material is available for the smallest, since 2 mature males and a female, probably a stage V juvenile, were taken. This species, *B. paulula* n. sp. is therefore designated as the type species.

A key to the species of *Bathyconchoecia* follows.

KEY TO THE SPECIES OF THE GENUS *Bathyconchoecia*

- | | |
|---|----------------------------------|
| 1. Length of mature specimens greater than 2.5 mm | 2 |
| 1. Length of mature specimens less than 2.5 mm | 4 |
| 2. Length of mature specimens around 3 mm | |
| | <i>B. sagittarius</i> n. sp. |
| 2. Length of mature specimens over 4.5 mm | 3 |
| 3. Male rostrum bifid, postero-dorsal corners of shell with a point or spine | <i>B. darcythompsoni</i> (Scott) |
| 3. Male rostrum not bifid, postero-dorsal corners rounded | |
| | <i>B. foveolata</i> n. sp. |
| 4. Length of mature specimens less than 1.5 mm | 5 |
| 4. Length of mature specimens greater than 1.5 mm | 6 |
| 5. Mature specimens 1 mm long or less, height of shell around 70% of length, postero-dorsal corners bluntly rounded | <i>B. paulula</i> n. sp. |
| 5. Mature specimens over 1.2 mm long, height 55–60% of length, postero-dorsal corners of shell sharply right-angled | |
| | <i>B. laqueata</i> n. sp. |



FIG. 2. Male *Bathyconchoecia paulula* n. sp. a, Coxa of mandible. b, Basis and endopodite of mandible. c, Furca. d, Basis and endopodite of maxilla. e, Sixth limb. f, Fifth limb. g, Pattern of sculpturing above ventral margin; arrow points anteriorly. Scale at upper right for c and d; at bottom for a, b, e, f, g. Scales in mm.

6. Shell strikingly sculptured with reticulations forming polygonal cells filled with tiny pits 7
 6. Shell not strikingly sculptured though punctate pattern may be present *B. galerita* n. sp.

7. Flange of sculpturing on posterior margin beneath shell glands
----- *B. kornickeri* n. sp.
7. No flange of sculpturing on posterior margin --- *B. lacunosa* (Müller)

***Bathyeconchoecia paulula* new species**

Figures 1-3

Holotype: Mature male, 0.95 mm long by 0.7 mm high (Figs. 1a-e, g-i, 3c). Two slides. USNM 123209.

Paratypes: Mature male, 0.93 mm long by 0.7 mm high (Figs. 1f, 2a-g). Two slides. USNM 123210. Female, possibly a stage V juvenile, 0.85 mm long by 0.6 mm high (Fig. 3a, b, d-l). Two slides. USNM 123211.

Type-locality: Both males were found in the intestine of *Dicromita agassizii*, a bottom fish collected at 1000 m depth in a midwater trawl (hit bottom) at 28°15'N, 87°02'W on 11 July 1966. The female was taken from the intestine of *Nezumia hildebrandi*, a bottom fish also collected at 1000 m depth in a midwater trawl at the same location and on the same date.

Etymology: The specific name "paulula" is the diminutive form of the Latin "paulus" = little, and refers to the small size of this species.

Description of male (Figs. 1, 2, 3c):

Shell (Fig. 1a-e): Height around 70% of length, shoulder vaults smoothly rounded, antero-ventral and postero-ventral corners rounded, postero-dorsal corners bluntly rounded, rostrum bent sharply downwards to about half the shell height and pointed at the tip, dorsal margin with a concavity at the hinge line which starts at approximately half the shell length and extends for nearly a quarter of the length. Shell with striking sculpture, reticulations and cross-striations forming a pattern of polygonal cells filled with tiny pits (Fig. 2g). These striations occur over the whole surface but are especially visible along the anterior, ventral and posterior margins and on and underneath the rostrum. The shell glands are at the postero-dorsal corners, the openings obscured by the sculpturing.

First antenna (Fig. 1f): This consists of 5 segments. The 4th segment bears distally the large feathered seta and ventrally the oval cluster, 0.1 mm long, of sensory filaments which in this species appear to number 250-300, arranged in 10-12 rows of approximately 25 per row. The tiny 5th segment bears the principal seta and the 3 shorter setae, which become weak and flabby filaments like those of the cluster.

Second antenna (Figs. 1g, i, 3c): This species has an exceptionally long basal segment to the exopodite, which is 71-72% of the length of the shaft (Fig. 3c). The length of the basal segment of the endopodite is approximately 29% that of the shaft. The basal segment bears distally 2 bristles, one of which, as is the case in this genus, is exceptionally long (Fig. 1i). Of the 2 terminal setae on the 2nd endopodite segment, the shorter is more than half as long as the longer (Fig. 3c). In

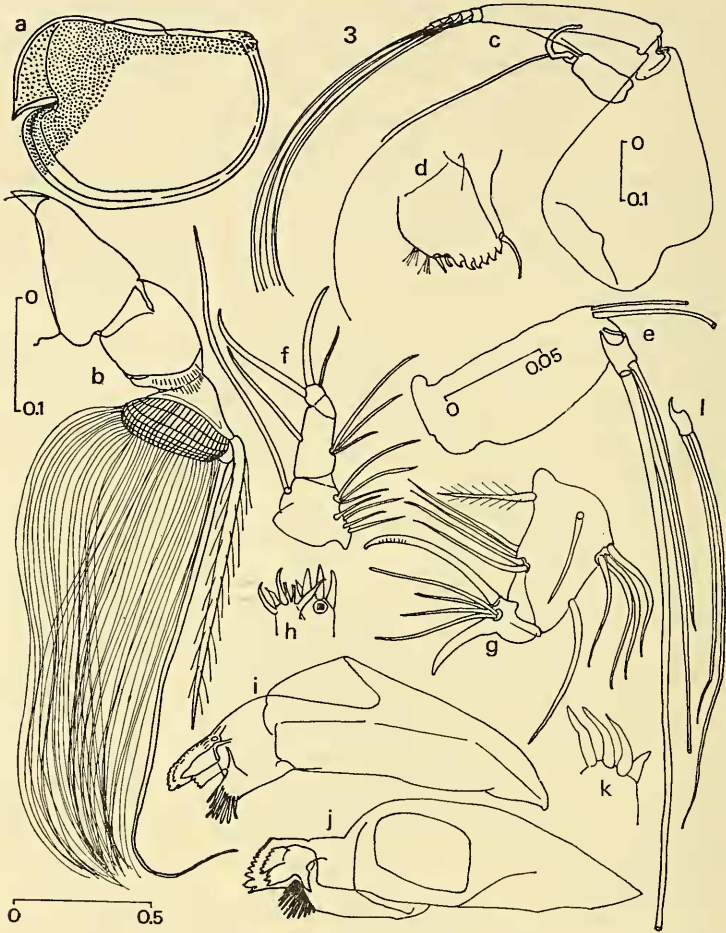


FIG. 3. *Bathyconchoecia paulula* n. sp. a, Lateral view of female shell. b, Female first antenna. c, Male right second antenna. d, Basis of female mandible. e, Endopodite of female left second antenna. f, Female fifth limb. g, Endopodite of female maxilla. h, Coxal endites of female maxilla. i and j, Coxa of female mandible. k, Portion of female coxal endite of maxilla. l, Last segment of female seventh limb. Scale at bottom left for a; on c for c; on e for e and k; at upper left for b, d, f, h, i, j, l. Scales in mm.

the genus *Euconchoecia* the longer of these 2 setae is exceptionally long, longer than the length of the shell. The right clasping organ (Fig. 1i) is slim and curves evenly beyond the basal section which bears the filaments. Only 2 filaments were found on both endopodites in this species, but the 3rd may possibly have broken off or been obscured by the 2 long setae. Two tiny spinules are present on the 2nd segment, beneath the curve of the right clasping organ. The left clasping organ has a small hook (Fig. 1g); aside from the 2 tiny spinules on the left 2nd endopodite segment, this species has an extra protrusion like a short fat curving spine, and this structure has not been found in the other species. In my experience only *Euconchoecia* males have a similar but more rounded protrusion in this location.

Mandible (Fig. 2a, b): The structure of the mandible is very similar in the 4 smaller species of *Bathyconchoecia*. All lack the protruding distal articular process of the coxa which is found in other Conchoeciinae. Also the longest setae on the 3rd endopodite segment are exceptionally long in these species. Of the 2 longest setae on this segment, the longer is around 0.35 mm long and the other approximately 0.25 mm long in the *B. paulula* male.

Maxilla (Fig. 2d): The longer claw on the 2nd endopodite segment is unusually long and slim. On the 1st endopodite segment there is a group of 4 setae distally, as in all the other species here described except *B. sagittarius*. This species differs from the other 3 smaller species in having a group of 4 setae near the basis, instead of 3 as in those species. Also, 3 of the large bristles of the coxal endite are bent characteristically sideways, as is illustrated for the female in Figure 3k.

Fifth limb (Fig. 2f): The last exopodite segment has 2 claw setae of unequal length and a shorter weaker seta. The 1st exopodite segment has one exceptionally long seta, which arises from a tubercle and extends beyond the tips of the claw-setae. There are 2 claws on the endopodite. The epipodial appendage has 3 groups of 4 plumose setae each.

Sixth limb (Fig. 2e): The last exopodite segment has one very long claw-seta and 2 shorter setae of equal length. The 1st segment has dorsally a very long seta arising from a tubercle. The epipodial appendage has 3 groups of setae arranged in a pattern of 6, 5, 5 setae.

The seventh limb was missing.

Penis (Fig. 1h): This is relatively short and bluntly rounded at the tip.

Furca (Fig. 2c): This has 8 pairs of long slim weak claws and an exceptionally long unpaired bristle behind the claws. The furcal lamella is covered with fine hairs from above the 3rd claw downwards. The function of the oval area behind the 2nd claw is not known. The last several pairs of claws are exceptionally long and slim. There are indications of jointing on the 1st claw, but the joints are not separated.

Description of female (Fig. 3a, b, d-1):

Shell (Fig. 3a): Height 70 percent of length, similar in shape to that

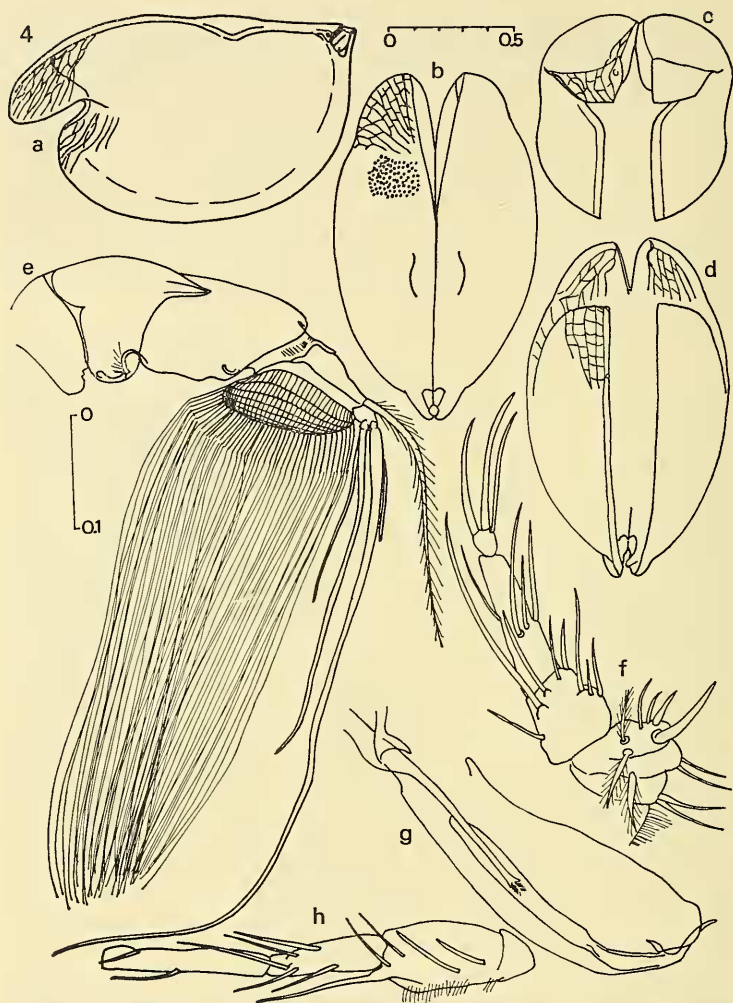


FIG. 4. Male *Bathyconchoecia laqueata* n. sp. a-d, Lateral, dorsal, anterior and ventral views of shell. e, First antenna. f, Fifth limb. g, Penis. h, Sixth limb lacking the 4th exopodite segment. Scale at top center for a-d; at left center for e-h. Scales in mm.

of the male, but with the maximum height in the anterior half. The shell of this specimen was stiff and brittle, not flexible like those of the other specimens, the entire surface covered with tiny pits. If striations had been present, they were lost. This specimen, 0.85 mm long by 0.6 mm high, is probably a stage V juvenile.

First antenna (Fig. 3b): This consists probably of 5 segments, the 4th bearing distally the large plumose seta and ventrally the cluster of sensory filaments. These filaments are arranged in 10–12 rows of around 25 per row, so 250–300 filaments are present, as in the male. The tiny last segment bears the principal seta; if 2 weaker and smaller setae were present, they were obscured by the large cluster of filaments.

Second antenna: This has the same relative proportions as that of the male illustrated in Figure 3c, the basal segment of the exopodite being three-quarters as long as the shaft. The basal segment of the endopodite is 30% the length of the shaft, and bears distally 2 bristles, both of which were broken (Fig. 3e) on this specimen. The 2nd endopodite segment has only the 2 distal setae, both of which were broken, and 1 filament. This specimen resembles the females of *Euconchoecia* in having only 1 filament, but in this case it may indicate that this female is a stage V juvenile, since female *B. lacunosa* (Müller) and *B. galerita* n. sp. have 2 setae and 3 filaments on the 2nd endopodite segment.

Mandible (Fig. 3d, i, j): This is similar to that of the male.

Maxilla (Fig. 3g, h, k): This is also similar to that of the male; the larger claw of the 2nd endopodite segment is also exceptionally long, and 3 of the bristles of the coxal endite are bent characteristically sideways.

Fifth limb (Fig. 3f): As in the male, the last segment of the exopodite has 2 claw-setae and a smaller seta, and the 1st segment has an exceptionally long seta arising from a tubercle, which extends well beyond the tips of the claw-setae. The endopodite has only 1 strong claw, possibly a juvenile character.

Sixth limb: This appears to be similar to that of the male, except that the long seta arising from a papilla on the 1st exopodite segment was much longer, at least twice as long as the limb itself.

Seventh limb (Fig. 3l): One of the 2 long setae of the last segment is a little shorter than the other.

The furca is similar to that of the male (Fig. 2c).

Remarks: *B. paulula* n. sp. differs from all the other species in its small size, in that the height of the shell is at least 70% of the length, and in that the basal segment of the exopodite of the second antenna is exceptionally long, approximately three-quarters the length of the shaft.

***Bathyconchoecia laqueata* new species**

Figures 4–5

Holotype: Male, 1.3 mm long by 0.75 mm high (Figs. 4, 5a–c, e, h). Two slides. USNM 123212.

Paratype: Male, 1.28 mm long (Fig. 5d, f, g). Two slides. USNM 123213.

Type-locality: Both males were found in the intestine of *Dicromita agassizii*, a bottom fish taken in a midwater trawl at 1000 m depth (hit bottom) at 28°15'N, 87°02'W on 11 July 1966.



FIG. 5. Male *Bathyconchoecia laqueata* n. sp. a, Endopodite of right second antenna. b, Basis and endopodite of maxilla. c, Coxa of mandible. d, Precoxal and coxal endites of maxilla. e, Second segment of endopodite of left second antenna (setae and filaments cut off). f, Right clasper organ (filaments cut off). g, Basis and endopodite of mandible. h, Molar and incisor surfaces of coxa of mandible. Scale at bottom left for a, c, g, h; at upper center for b, d; at right center for e, f. Scales in mm.

Etymology: The specific name is derived from the Latin "laqueatus" = fretted, paneled, pitted, and refers to the sculpturing of the shell of this species.

Description of male: Shell (Fig. 4a-d): Height 57-58 percent of length, shoulder vaults smoothly rounded, antero-ventral and postero-ventral corners rounded, dorsal margin with a concavity at the hinge line which starts just behind the midline, postero-dorsal corners sharply right-angled with shell glands opening on the dorsal side. The shell is strikingly sculptured, with striations forming irregular polygonal cells filled with tiny pits, as is indicated in Figure 4a-d. These striations are particularly noticeable on the rostrum and the anterior, ventral and posterior margins. The underside of the rostrum is also similarly sculptured. The sculpturing is similar to that of *B. paulula* n. sp. and *B. kornickeri* n. sp., and also to that described for *B. lacunosa* (Müller).

First antenna (Fig. 4e): This consists of 5 segments, the first 2 relatively short. It was not possible to distinguish any remnant of a frontal organ from the pointed thickenings of the exoskeleton. There are some fine hairs on the anterior margin of the 3rd segment or the posterior margin of the 4th. The cluster of sensory filaments on the 4th segment is slightly over 0.1 mm long and consists of 10-12 rows of 26-28 filaments each, so approximately 250-350 filaments are present. The principal seta is bare of spinules and approximately 0.7 mm long. Figure 4e shows the relative lengths of the other setae and filaments.

Second antenna (Fig. 5a, e, f): The basal segment of the exopodite is rather long, around 65 percent of the length of the shaft. The long exopodite setae are approximately 0.6 mm long. The basal segment of the endopodite, which is 38-40 percent of the length of the shaft, has a more lumpy shape than that of the other species. It bears distally 2 setae, the longer approximately twice the length of the shorter one. The right clasping organ is slim and strongly curved and bears, from its proximal section, 3 filaments whose relative lengths are shown in Figure 5a. The second segment of the endopodite has 2 short fat spines beneath the curve of the clasping organ, and bears 2 long setae, the longest of which was 0.8 mm long. The left clasping organ (Fig. 5e) has a small hook.

Mandible (Fig. 5c, g, h): The longest seta of the 3rd segment of the endopodite is exceptionally long (0.32 mm) in this species, as it is in the other smaller species. The incisor and molar surfaces of the coxa are also similar to those of the other smaller species.

Maxilla (Fig. 5b, d): The basal segment of the endopodite has a cluster of 3 setae near the basis, as in *B. galerita* n. sp. and *B. kornickeri* n. sp. The maxilla most closely resembles that of the latter species, except that 2 bristles of the precoxal endite that are quite small in *B. laqueata* are long and slim in *B. kornickeri*, as well as in *B. galerita*.

Fifth limb (Fig. 4f): The endopodite has 2 claws. One of the 2 claw-setae on the 3rd exopodite segment is longer, the shorter one

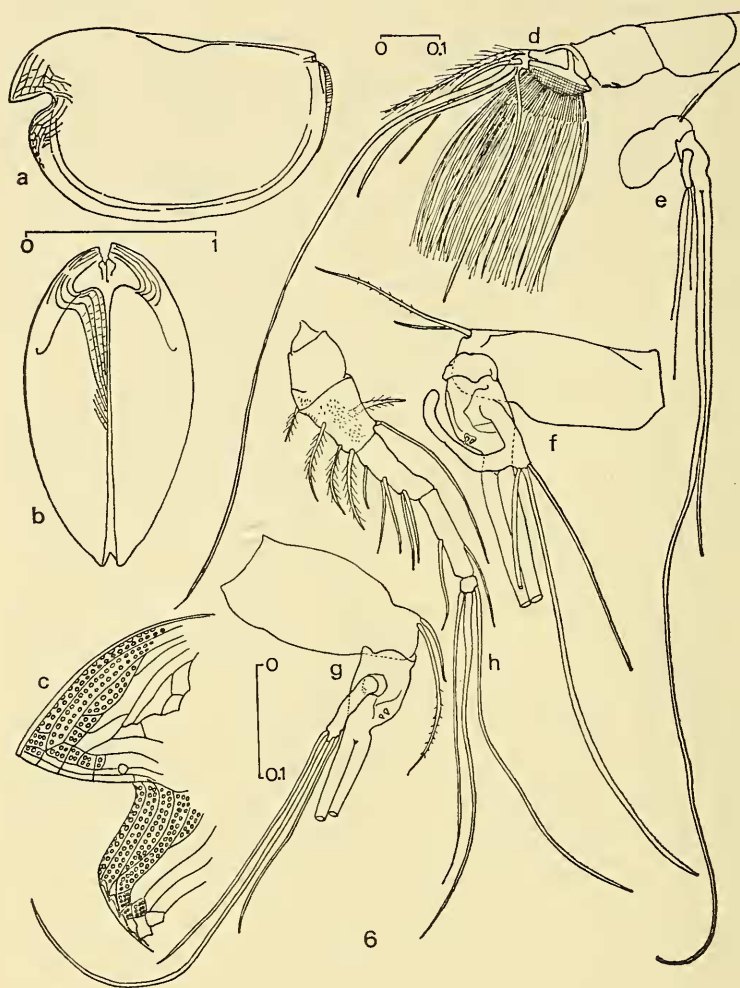


FIG. 6. Male *Bathyconchoecia kornickeri* n. sp. a-b, Lateral and ventral views of shell. c, Rostrum and portion of anterior margin of shell. d, First antenna. e, Endopodite of left second antenna. f, Endopodite of right second antenna (setae cut off). g, Endopodite of left second antenna (setae cut off). h, Sixth limb. Scale at upper left for a and b; at top center for c, d, e, h; at lower center for f, g. Scales in mm.

similar in length to the seta of this segment. The 1st exopodite segment has an exceptionally long seta arising from a papilla.

Sixth limb (Fig. 4h): The last segment was broken off. This limb differs from that of the other smaller species in that the seta arising from a tubercle on the 1st segment is much shorter.

Penis (Fig. 4g): This is fairly similar in shape to that of the *B. paulula* male.

The seventh limb and furca were lost.

The female is not known.

Remarks: This species differs from the others in that the postero-dorsal corners of the shell are sharply right-angled, with the shell glands opening on the dorsal side.

***Bathyconchoecia kornickeri* new species**

Figures 6-7

Holotype: Male, 1.66 mm long by 0.92 mm high. One slide. USNM 123214.

Type-locality: Intestine of *Dicromita agassizii*, a bottom fish taken in a midwater trawl at 1000 m depth (hit bottom), at 28°15'N, 87°02'W on July 11, 1966.

This species is named for Dr. Louis S. Kornicker.

Description of male: Shell (Fig. 6a-c). Height 55-56 percent of length, antero-ventral and postero-ventral corners rounded, postero-dorsal corner definite, dorsal margin straight in lateral view but with a concavity at the hinge line at approximately half the shell length, rostrum pointed and curving sharply downward. The sculpturing of the shell is striking, and is similar to that of *B. paulula* n. sp. and *B. laqueata* n. sp. The entire surface of the shell is punctate, and especially on and beneath the rostrum and on the anterior margins striations form an irregular pattern of polygonal cells, each with the small pits arranged inside (Fig. 6c). Just below the postero-dorsal corner and below the symmetrical shell glands the sculpturing is prolonged in a flange for a short distance on the posterior margin.

First antenna (Fig. 6d): This consists of 5 segments, although the basal segment is quite short and not clearly delimited from the 2nd segment. No remnant of a frontal organ was found. The 4th segment bears distally the plumose seta and ventrally the large oval cluster of sensory filaments, of which there are around 250-300 in all, arranged in 10-12 rows of 24-25 filaments per row, as in *B. paulula* n. sp. The exact length of the fine filaments could not be determined, but they were probably considerably longer than is shown in Figure 6d. The 5th segment bears the principal seta and the 3 shorter setae, the relative lengths of which are illustrated in Figure 6d.

Second antenna (Fig. 6e, f, g): The length of the basal segment of the exopodite is around 63 percent that of the shaft; the long exopodite bristles are 0.75-0.8 mm long. The basal segment of the endopodite is

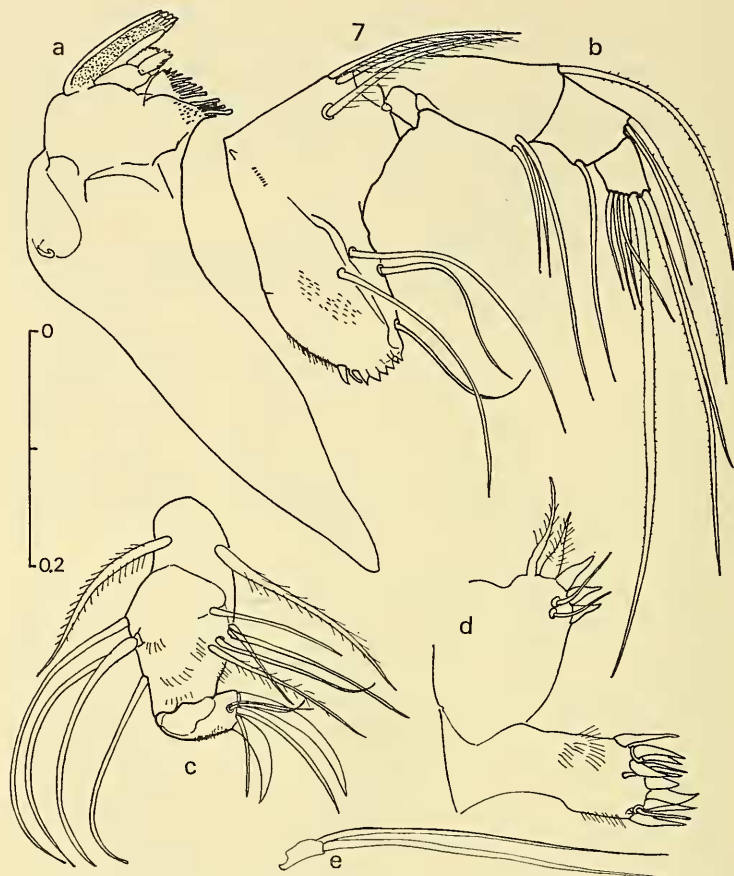


FIG. 7. Male *Bathyconchoecia kornickeri* n. sp. a, Coxa of mandible. b, Basis and endopodite of mandible. c, Basis and endopodite of maxilla. d, Coxal and precoxal endites of the maxilla. e, Last segment of seventh limb. Scale at left center for a-e. Scale in mm.

33-34 percent the length of the shaft. The relative lengths of the setae and filaments of the left endopodite are shown in Figure 6e. The longer seta of the 2nd segment is more than twice as long as the shorter seta; though broken near the tip it measured 1.45 mm in length. The 2nd endopodite segment also has 2 short fat spinules as in the other species. The right clasp ing organ is strong and sharply curved (Fig. 6f) and bears 3 filaments. On the left endopodite (Fig. 6g) the 3 filaments were produced from the basal portion of the clasp ing organ; no hook was present, but it may have been broken off.

Mandible (Fig. 7a, b): This is similar to that of the other smaller species.

Maxilla (Fig. 7c, d): This resembles most closely that of *B. laqueata* n. sp., and, as in *B. laqueata* and *B. galerita* n. sp., there is a cluster of 3 setae on the basal segment of the endopodite near the basis. As in the other species, except *B. sagittarius* n. sp., there are 4 setae on the distal margin of the 1st endopodite segment. The coxal and precoxal endites are similar to those of the other smaller species, but have shorter and fewer bristles than the 2 larger species, *B. sagittarius* n. sp. and *B. foveolata* n. sp.

Sixth limb (Fig. 6h): This differs from that of the other known males of *Bathyconchoecia* in that the 3 setae on the last exopodite segment are all long, one somewhat shorter than the other 2. As in most of the other species, the seta borne on a tubercle on the 1st segment is quite long. The epipodial appendages of the sixth limb consist of 3 groups of plumose setae in the pattern of 5, 5, 7 setae each. Those of the fifth limb have groups of 4, 4, 5 setae each.

Seventh limb (Fig. 7e): This differs from that of the other species in that the last segment has 2 long setae of the same length, approximately 0.3 mm long.

The fifth limb, penis and furca were lost.

The female is not known.

Remarks: This species is similar in size and in the sculpturing of the shell to *B. lacunosa*, which Müller (1908) described from a female specimen, possibly a stage V juvenile, 1.6 mm long, in his report on the ostracods of the Deutsche Südpolar Expedition. Since this sculpturing occurs in several species and Müller did not mention the flange of sculpturing on the posterior margin nor describe the appendages so that they could be compared with those of this male, it is impossible to determine whether these two specimens are conspecific.

***Bathyconchoecia galerita* new species**

Figures 8-9

Holotype: Female, 1.9 mm long by 1.2 mm high. Two slides. USNM 123215.

Type-locality: Stomach of *Nezumia hildebrandi*, a bottom fish taken in a midwater trawl at 1000 m depth on 11 July 1966 at 28°15'N, 87°02'W.

Etymology: The specific name is derived from the Latin "galeritus" = wearing a hood, and refers to the hood-like shape of the rostrum of this species.

Description of female: In the other specimens, taken from fish intestines, all traces of soft tissues were gone, leaving only the exoskeletons of the appendages. This is the only specimen from a fish stomach and much of the musculature remained, or was in process of being dissolved.

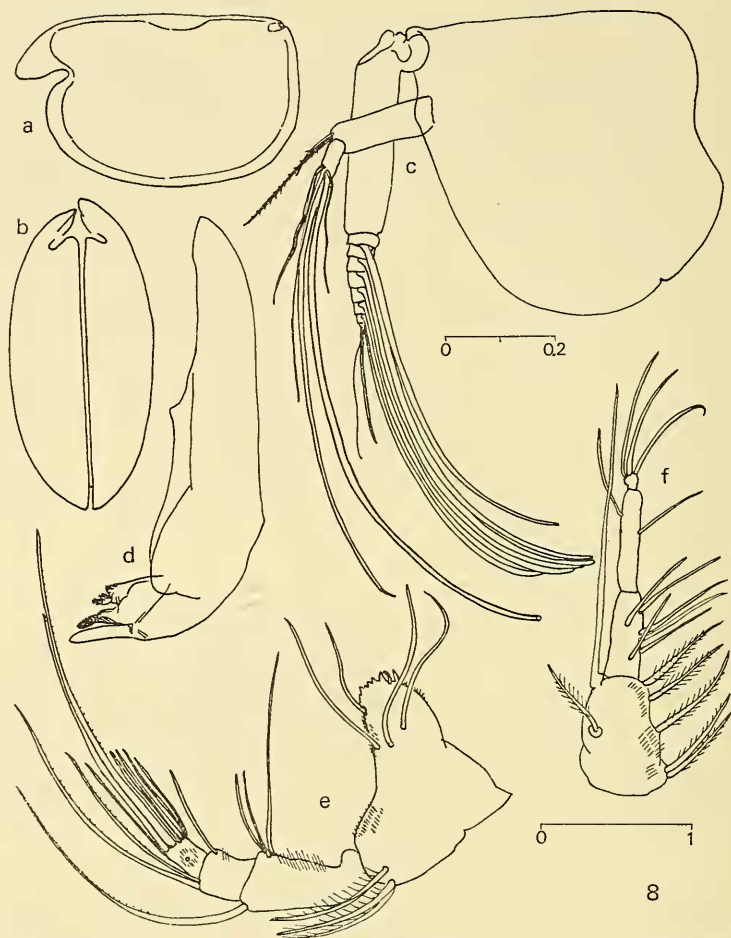


FIG. 8. Female *Bathyconchoecia galerita* n. sp. a-b, Lateral and ventral views of shell. c, Right second antenna. d, Coxa of mandible. e, Basis and endopodite of mandible. f, Sixth limb. Scale at upper right for c-f; at lower right for a, b. Scales in mm.

Shell (Fig. 8a, b): Height three-fifths the length, antero-ventral and postero-ventral corners rounded, dorsal margin nearly straight but with a concavity at the hinge line at approximately half the shell length, rostrum relatively large and rounded at the tip. Very faint traces of sculpturing in a pitted scale-like pattern, as in the other species, were found around the rostral area, so in life the shell may have been covered with a punctate pattern. No indications of striations or other sculpturing

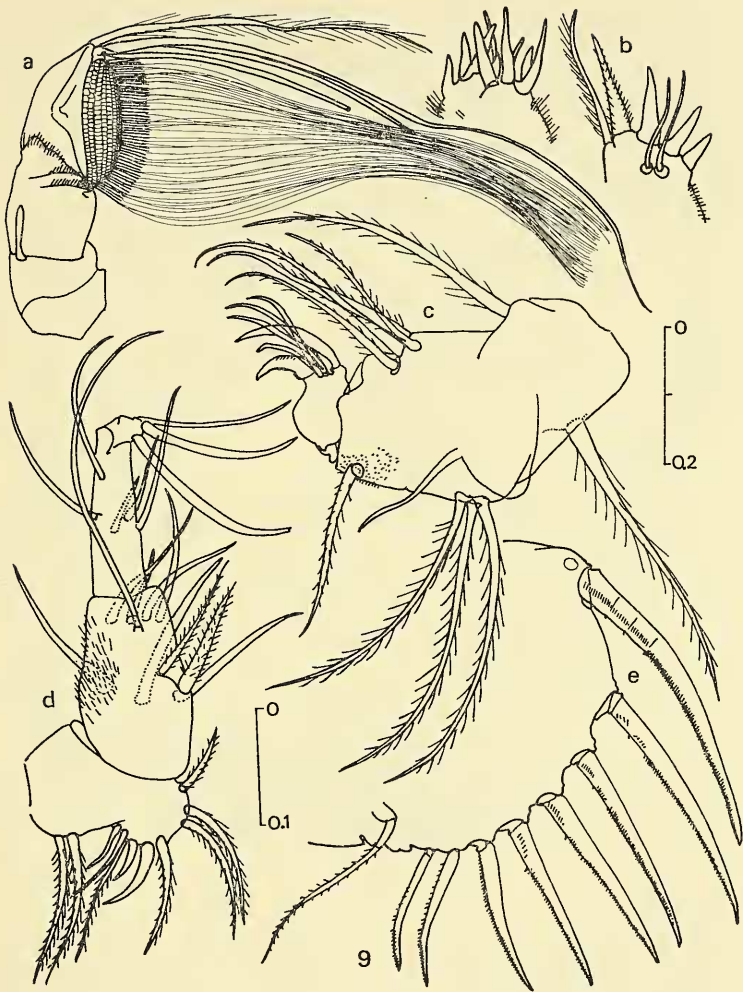


FIG. 9. Female *Bathyconchoecia galerita* n. sp. a, First antenna. b, Coxal and precoxal endites of maxilla. c, Basis and endopodite of maxilla. d, Fifth limb. e, Furca. Scale at right for a; at lower left for b-e. Scales in mm.

were found. The shell glands are at the postero-dorsal corner of each shell. The body of the animal compactly filled the shell, and the posterior part of the body was tightly crammed with 4 large eggs 0.30–0.33 mm in diameter.

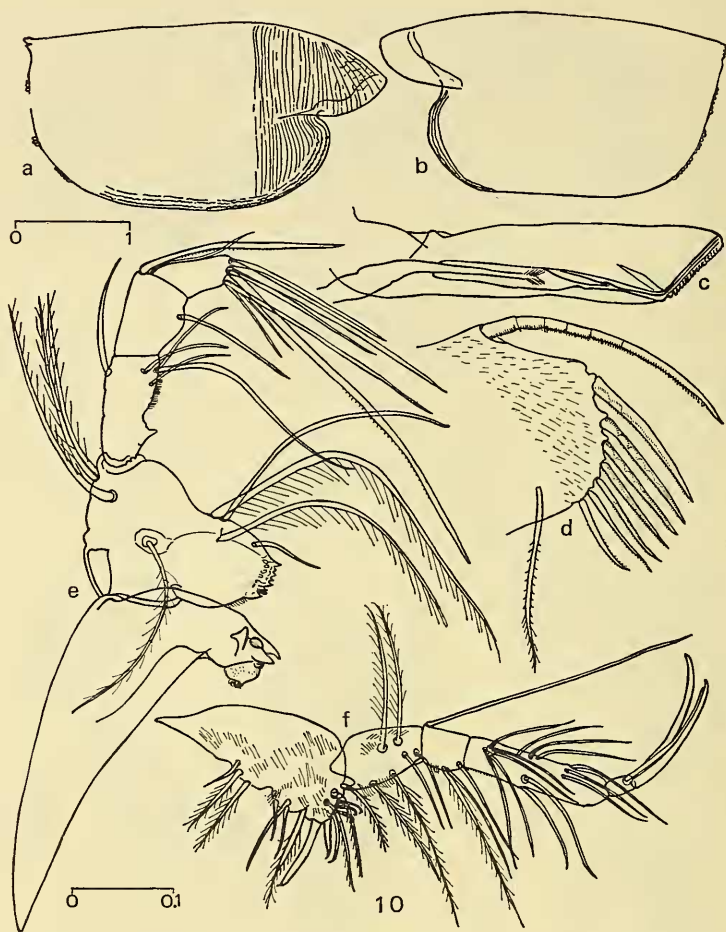


FIG. 10. Male *Bathyconchoecia sagittarius* n. sp. a-b, Lateral views of right and of left shells. c, Penis. d, Furca. e, Mandible. f, Fifth limb. Scale at upper left for a and b; at bottom left for c-f. Both scales in mm.

First antenna (Fig. 9a): This consists of 4 to 5 segments. The first 2 (?) segments are short, and the tiny last segment which bears the principal seta and the 2 smaller setae is not clearly separated from the 4th segment. The anterior edge of the 3rd segment has several rows of long hairs laterally. The 4th segment bears distally the large plumose seta and ventrally the cluster of sensory filaments, which consisted of

12–15 rows of 35–38 filaments each, so there were at least 400–500 filaments in the cluster.

Second antenna (Fig. 8c): The shaft is stout, and the length of the basal segment of the exopodite is 54–55 percent that of the shaft. The long setae of the exopodite segments are approximately 0.8 mm long. The basal segment of the endopodite, which is around 26 percent the length of the shaft, has distally 2 setae, the larger one well over twice as long as the other. The last segment bears 2 long setae and 3 filaments. Figure 8c shows the relative lengths of the setae and filaments, except for the longest seta which was broken on both endopodites.

Mandible (Fig. 8d, e): This is very similar to that of the 3 other smaller species.

Maxilla (Fig. 9b, c): This is distinctive, in that the claws of the 2nd endopodite segment are short and stumpy, unlike those of any other of these species. On the 1st endopodite segment there is a cluster of only 3 setae near the basis, as in *B. laqueata* n. sp. and *B. kornickeri* n. sp.

Fifth limb (Fig. 9d): The last exopodite segment has 2 strong curved claw-setae and a weaker seta, all of about the same length. The 1st segment differs from that of the other smaller species in having 9 setae as well as a long seta which arises distally from a tubercle. The endopodite has 2 claws, and the endopodite and protopodite, which are not clearly separated, together have 9 setae.

Sixth limb (Fig. 8f): The last exopodite segment has 2 relatively short claw-setae and a weaker seta, all of about the same length. The 1st segment has distally a very long seta borne on a tubercle.

The seventh limb was lost.

Furca (Fig. 9e): This has 8 pairs of long weak claws, which decrease gradually in length posteriorly, and a long unpaired bristle. There is a small circular area of unknown function near the base of the 1st claw. The 1st claw shows indications of jointing, but is not actually separated into joints.

The male is not known.

Remarks: This species is similar in shape to *B. lacunosa* (Müller), but lacks the sculpturing described for this species. Also the relative lengths of the filaments and setae of the endopodite of the second antenna are different from those figured by Müller (1908, Pl. X. Fig. 6) for *B. lacunosa*. *B. galerita* n. sp. differs from all the other species in the lack of sculpturing on the shell and in the character of the maxilla and the number of setae on the 1st exopodite segment of the fifth limb.

***Bathyconchoecia sagittarius* new species**

Figures 10–11

Holotype: Male, 3.1 mm long by 1.6 mm high. Three slides. USNM 123216.

Type-locality: Intestine of *Bassozetus normalis*, an abyssal bottom fish

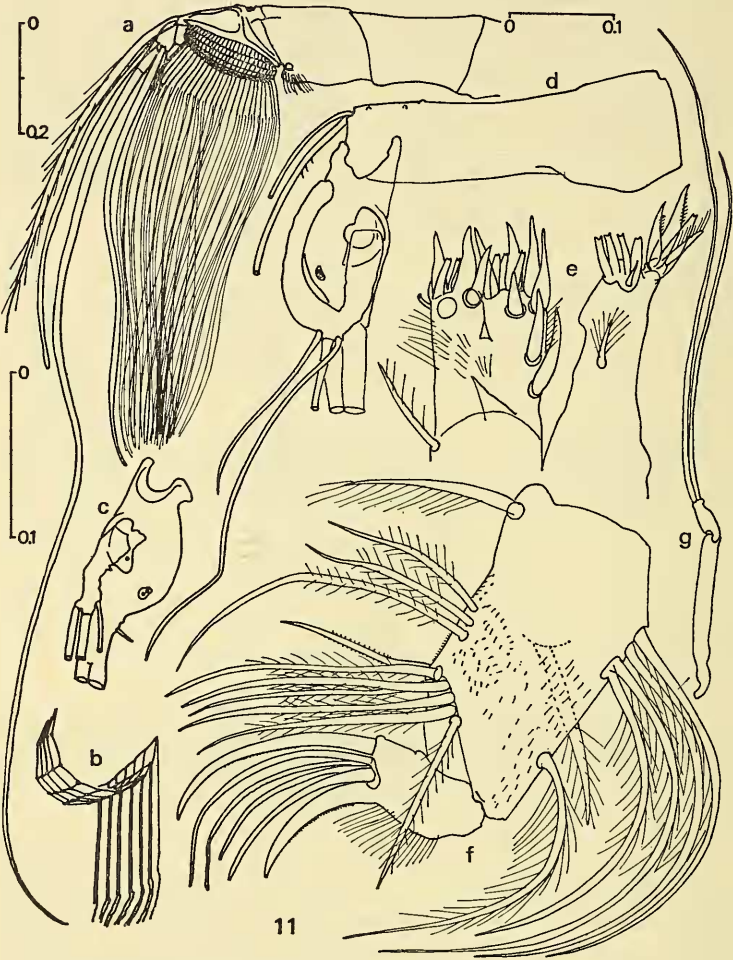


FIG. 11. Male *Bathyconchoecia sagittarius* n. sp. a, First antenna. b, Cross-section of fragment of cluster of filaments of the first antenna. c, Second segment of endopodite of left second antenna (setae and filaments cut off). d, Endopodite of right second antenna (setae and 1 filament cut off). e, Coxal and precoxal endites of the maxilla. f, Endopodite segments of the maxilla. g, Seventh limb. Scale at top left for a and g; at left center for b, at top right for c-f. Scales in mm.

taken in a dredge at a depth of 3165 m on 27 July 1967 at 25°26.5'N, 86°06'W.

Etymology: The specific name is derived from the Latin noun "sagittarius" = archer, bowman. This species is named for Dr. Thomas E. Bowman.

Description of male: This specimen was crumpled into a ball, and part of the posterior margin of the shell was damaged, but most of the appendages were essentially intact.

Shell (Fig. 11a, b): Height approximately half the length, dorsal margin slightly curved, antero-ventral and postero-ventral corners rounded, postero-dorsal corner of the right shell produced in a blunt point, rostrum large, rounded, protruding well forward and curving down to approximately half the shell height. In the condition in which it was found, the shell is pliable, not brittle. Sculpturing covered the entire surface, consisting primarily of fine striations running dorso-ventrally, with some cross-striations producing polygonal or diamond-shaped cells, particularly on and beneath the rostrum and on and near the anterior margin. Indications of the pattern of tiny pits were also present, but it is impossible to determine whether the entire surface of the shell had been punctate as in most of the other species. The posterior margins of both shells were damaged, but enough of the margins remained to show that the entire posterior margin was edged with a single row of dentate structures which started at the postero-dorsal corner and became smaller ventrally, ending at the postero-ventral corner. It was not possible to determine the location of the shell glands; presumably they are just below the postero-dorsal corners.

First antenna (Fig. 11a, b): There is a tuft of long hairs ventrally at the distal end of the 3rd segment. The 4th segment bears distally the large plumose seta and ventrally the cluster of sensory filaments which are arranged in approximately 12 rows of 25-28 filaments per row, so around 300 filaments are present. Figure 11b shows a cross-section of a fragment of the cluster; from each facet of the cluster a filament is produced which extends stiffly for a short distance, then becomes very weak and flabby. The tiny 5th segment bears the principal seta and 3 shorter setae which become flabby sensory filaments. The principal seta of each first antenna was broken, so its length is not known, but it is at least as long as is illustrated in Figure 11a. No remnant of a frontal organ was found on this specimen.

Second antenna (Fig. 11c, d): The length of the basal segment of the exopodite is 60 percent that of the shaft. The basal segment of the endopodite of the right second antenna, which is nearly 40 percent the length of the shaft, has distally 2 setae, both of which were broken in this specimen, but evidently they are exceptionally long. The 2nd endopodite segment has distally 2 long setae, the longer of which was broken at a length of 1.9 mm. The right clasping organ (Fig. 11d) is a large and strongly curved hook which bears at its bend 3 filaments

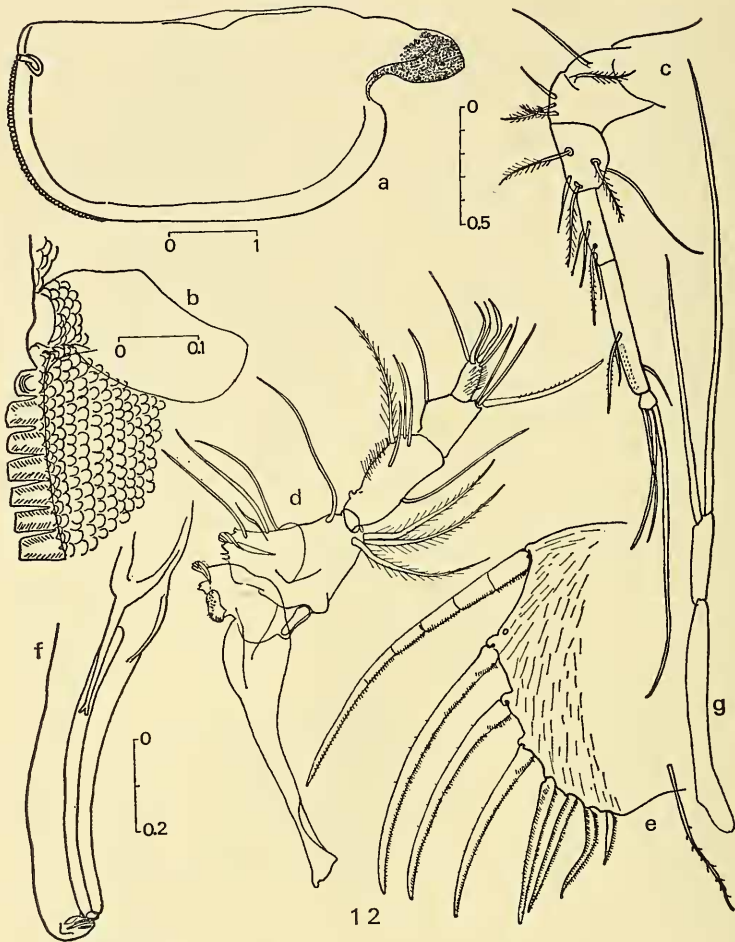


FIG. 12. Male *Bathyconchoecia foveolata* n. sp. a, Lateral view of right shell. b, Sculpturing of shell below shell gland. c, Sixth limb. d, Mandible. e, Furca. f, Penis. g, Seventh limb. Scale below a for a; at lower left for e and f; on b for b; at upper right for c, d, g. Scales in mm.

of varying lengths. The 2nd segment also has 2 tiny spinules beneath the curve of the clasping organ, and another spinule at the base of the 2 long setae. The 2nd segment of the left endopodite (Fig. 11c) also has these 3 spinules, but the base of the left clasping organ bore only the 3 filaments, and no hook was present.

Mandible (Fig. 10e): The basis and endopodite are similar to the other species described here, except *B. foveolata* n. sp. This species differs from all the others in having a relatively sharp, knob-like distal articular process on the coxa, and also in the structure of the incisor and molar surfaces of the coxa.

Maxilla (Fig. 11e, f): This species differs from all the others in having a row of 7 setae at the distal end of the 1st endopodite segment plus a group of 3 more setae, making 10 in all, in the location where the other species have no more than 4 setae (compare, for example, Fig. 2d with Fig. 11f). There are more bristles on the coxal and precoxal endites (Fig. 11e) than in any of the smaller species; these bristles are shorter and fatter than in *B. foveolata* n. sp.

Fifth limb (Fig. 10f): This differs from that of all the others here described, with the possible exception of *B. foveolata* n. sp., in that there appear to be 4, instead of 3, exopodite segments. At the joint between the 1st and 2nd segments there is an exceptionally long seta arising from a tubercle. The last segment has 2 claw-setae, one slightly longer than the other, and a slightly shorter seta. The 3rd segment has 13 setae, instead of 4-5, as in the other species. The endopodite has 2 claws and 4 curved spines. The separation between the endopodite and protopodite is not clear, but together there are 9 setae, 5 of these plumose.

Sixth limb: This also has more setae than in the other species. The setae were broken from the last segment, but the 3rd segment has a total of 8 setae (other species have 2), the 2nd segment has 12 setae (other species have 4-5), and the 1st segment has 5 setae plus an exceptionally long seta arising from a tubercle at the distal end.

The epipodial appendages of the 5th limb have 3 groups of plumose setae in the pattern of 5, 4, 4 setae each; those of the sixth limb have 3 groups of 7, 5, 5 setae each.

Seventh limb (Fig. 11g): This bears distally 2 long setae, one 0.6 mm long, the other nearly 0.8 mm long.

Penis (Fig. 10c): The shape is distinctive. The distal end is straight and truncates the long axis at 45°.

Furca (Fig. 10d): This has 8 pairs of exceptionally thin weak claws, the last 2 pairs more like setae than claws, and an unusually long unpaired bristle behind the claws. The distance between the 6-jointed 1st claw and the 2nd claw is exceptionally great, and an extra bump is present in front of the 2nd claw.

The female is not known.

Remarks: This species differs from all the others in the type of sculpturing, in the coxa of the mandible, and in the greater number of setae or bristles on the maxilla and fifth and sixth limbs.

***Bathyconchoecia foveolata* new species**

Figures 12-13

Holotype: Male, 5.2 mm long by 2.2 mm high. Two slides. USNM 123217.

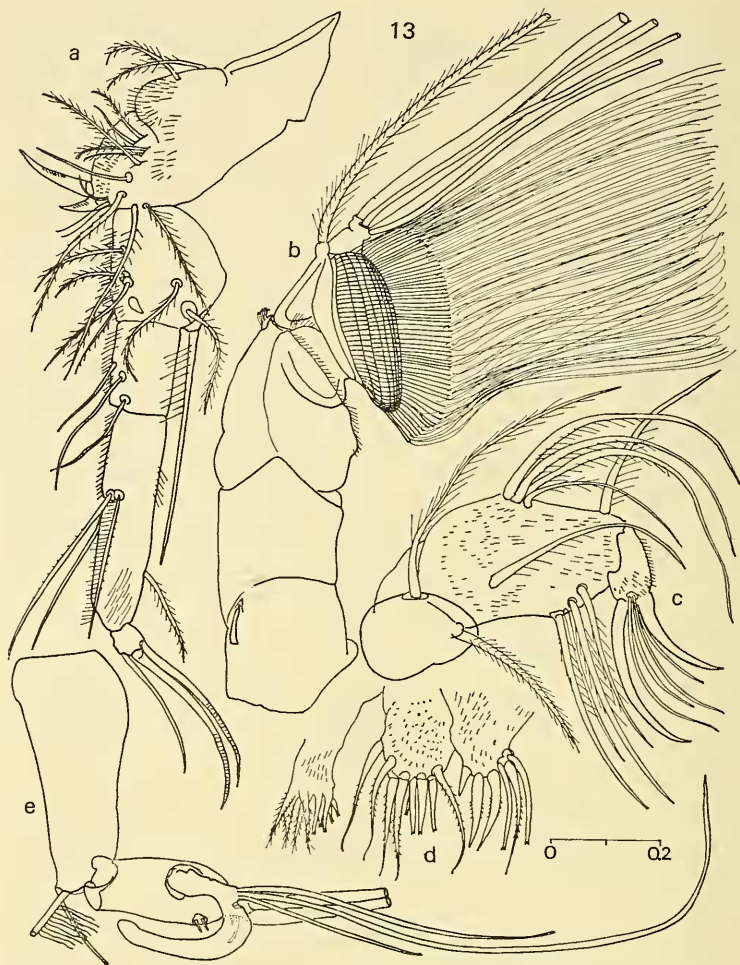


FIG. 13. Male *Bathyconchoecia foveolata* n. sp. a, Fifth limb. b, First antenna. c, Basis and endopodite segments of maxilla. d, Pre-coxal and coxal endites of maxilla. e, Endopodite of right second antenna (setae cut off). Scale at bottom right for a-e. Scale in mm.

Type-locality: Intestine of *Bassozetus normalis*, a bottom fish taken in a dredge at 3165 m depth on 27 July 1967 at 25°26.5'N, 86°06'W.

Etymology: The specific name is derived from the Latin "foveola" = little pits, and refers to the sculpturing of the shell of this species.

Description of male: Shell (Fig. 12a, b): This is a large species, the

height of the shell two-fifths the length, antero-ventral and postero-ventral corners rounded, ventral margin straight, dorsal margin nearly straight with a slight concavity at the hinge line at approximately half the shell length. The rostrum is large and rounded and projects well beyond the anterior margin for approximately one-sixth the shell length. The entire surface of the shell is covered with a sculpturing of tiny pits in a small scale-like pattern, as is indicated on the rostrum in Figure 12a and shown more highly magnified in Figure 12b, which also shows the single row of dentate structures which extends down the posterior margin from the shell gland to just anterior to the postero-ventral corner. The shell glands are situated symmetrically just below the postero-dorsal corner of each shell.

First antenna (Fig. 13b): This consists of 5 segments and is similar in structure to that of the other males here described. The basal segment has a small peg-like structure antero-distally, which may represent a remnant of the frontal organ or be only a thickening of the integument. At the dorsal distal margin of the 3rd segment there is a row of sharply curved spines, and a row of hairs extends down the lateral distal margin of this segment and continues posteriorly on the ventral surface. Some long hairs are also present on the 4th segment above the cluster of sensory filaments. This cluster is 0.35 mm long, and consists of 16–20 rows of approximately 35 filaments per row, making a total of 550–700 filaments in all. These filaments were tangled in debris and are undoubtedly considerably longer than is shown in Figure 13b. Aside from the large plumose seta borne antero-distally on the 4th segment, the small 5th segment has the large principal seta and 3 smaller setae. The 2 shorter setae were approximately 0.9 and 1.0 mm long; the longer setae were broken.

Second antenna (Fig. 13e): The length of the basal segment of the exopodite is 60 percent that of the shaft, the basal segment of the endopodite 33.5 percent of shaft length. The endopodite of the left second antenna was broken off, but that of the right is illustrated in Figure 13e. Both the long setae of the 2nd segment were broken. The right clasping organ is large and strong and curves around the 2nd segment, 3 filaments being produced from its basal section. Two short fat spinules are present beneath the curve of the clasping organ and 2 more spinules are situated at the base of the 2 long setae. The larger of the 2 setae of the 2nd segment has some tiny spinules down its length. This seta, broken near the tip, was 3.5 mm long; the shorter seta, also broken near the tip, was 1.3 mm long. Both of the bristles at the distal end of the basal segment were also broken.

Mandible (Fig. 12d): This differs from all the other species. The structure of the molar and incisor surfaces of the coxa and the incisor surface of the basis is different. Also, the last endopodite segment is proportionately much smaller and has fewer setae than the other species.

It resembles the others, however, in having a group of 3 plumose setae at the distal end of the basis.

Maxilla (Fig. 13c, d): The endopodite is similar to that of the other species, except *B. sagittarius* n. sp. The bristles of the coxal and precoxal endites (Fig. 13d) are much longer and slimmer than those of *B. sagittarius* n. sp. and are also more numerous than in the smaller species.

Fifth limb (Fig. 13a): The endopodite has 2 strong claws, and is not clearly separated from the protopodite. The basal segment of the exopodite is not as definitely separated into 2 segments as in the *B. sagittarius* male, so it is difficult to decide whether the exopodite has 3 or 4 segments. As in *B. sagittarius*, at the possible joint between the 1st and 2nd exopodite segments a long seta is produced. The last exopodite segment has 2 relatively short sub-equal claw-setae and a shorter seta. The epipodial appendages of the fifth limb have 3 groups of 5, 4, 4 plumose setae each.

Sixth limb (Fig. 12c): The exopodite has 4 segments, the last segment bearing 1 long seta and 2 shorter ones about half as long as the longest. The 1st segment has a long seta, but this is not exceptionally long as in some of the species. The epipodial appendage has 3 groups of setae arranged as 7, 5, 5 setae each.

Seventh limb (Fig. 12g): This bears distally 2 long setae, the longer 1.7 mm long, the shorter 1.15 mm long.

Penis (Fig. 12f): This is long and slim, bluntly rounded at the tip.

Furca (Fig. 12e): The first several pairs of claws are exceptionally long, weak and slim, the last several pairs quite short, and there is an unpaired bristle behind the claws. The 1st claw is 5-jointed, with indications of a 6th joint. Near the base of the 2nd claw there is a tiny circular area. The furcal lamella is covered with hairs.

The female is unknown.

Remarks: This species is in the same size range as *B. darcythompsoni* (Scott). In the latter species, however, the male rostrum is bifid and there is a small point at the postero-dorsal corner of each shell. *B. foveolata* n. sp. is distinctive in the size, shape, and sculpturing of the shell and differs from the other species primarily in the structure of the mandible.

The two previously described species, *B. lacunosa* (Müller) and *B. darcythompsoni* (Scott), were originally placed in the genus *Euconchoecia* because the sensory filaments on the last 2 segments of the first antenna were numerous. Müller (1908, p. 10, Pl. X, Figs. 1-8) noted that in the shape and sculpturing of the shell and the structure of the appendages *lacunosa* differed widely from *Euconchoecia chierchiaie*, the type species. His description, particularly of the sculpturing of the shell

and of the first and second antenna and mandible show that this species belongs in the group of smaller species of *Bathyconchoecia*, together with *B. paulula* n. sp., *B. laqueata* n. sp., and *B. kornickeri* n. sp. From Scott's (1909, p. 128, Pl. III, Fig. 19, Pl. IV, Figs. 1-12) description and figures of *darcythompsoni* it is evident that this species also belong to the genus *Bathyconchoecia*.

The removal of these 2 species to the genus *Bathyconchoecia* leaves in the genus *Euconchoecia* only 2 very closely related species, *E. chierchiae* Müller and *E. aculeata* (Scott). These species live in the upper waters of warmer seas and are tropical-subtropical in distribution. *E. chierchiae* has been recorded in the Atlantic from 42°N to 20°S, and, according to Müller (1906), *E. aculeata* from 10°N-11°S in the Indian Ocean. *E. chierchiae* was described from the coast of Brazil (Müller, 1890), and *E. aculeata* from the Gulf of Guinea (Scott, 1894). In the Sargasso Sea (Deevey, 1968) *E. chierchiae* occurred seasonally over an extreme possible temperature range of 16.6-27.3°C. These are small species, around 1 mm long, with delicate shells, lacking sculpturing. In the females the body of the animal does not fill the shell, and, as in no other known Halocyprid, large eggs are carried between the back of the body and the shell.

The species of *Bathyconchoecia* are apparently living at considerable depths, either on or just above the bottom in regions not easily sampled with plankton nets. That three bottom fish should eat 9 specimens of 6 new species may indicate that many more species still are to be found. The species here described were taken at depths of 1000 and 3165 m. *B. lacunosa* was collected on 2 December 1902 at the Gaussstation, 66°2'9"S, 89°38'E in the Indian Ocean sector of the Antarctic in a qualitative sample, probably a bottom sample, since Müller (1908) noted that the bottom net samples obviously caught pelagic species while being pulled up. *B. darcythompsoni* was collected in August 1907 from a depth of 1140 m in the Atlantic north of Scotland. In the shape of the shell, the presence of a well-developed rostrum and in the character of the furca these forms are immediately recogniz-

able as belonging to the family Halocyprididae; however, these are pelagic species that, particularly in the extraordinary development of the large cluster of sensory filaments on the 4th segment of the first antenna, have become specialized for living in the depths of the sea.

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